

CLAIMS:

1. An electrode structure for a display device comprising:

5 a plurality of first electrodes disposed over a backplate, said plurality of first electrodes further comprising a metal alloy;

a dielectric layer disposed over said plurality of first electrodes; and

10 a plurality of second electrodes, said plurality of second electrodes disposed over said dielectric layer, said plurality of second electrodes further comprising said metal alloy.

15 2. An electrode structure for a display as recited in Claim 1 wherein said plurality of first electrodes are row electrodes and said plurality of second electrodes are column electrodes.

20 3. An electrode structure for a display as recited in Claim 1 wherein said plurality of first electrodes are column electrodes and said plurality of second electrodes are row electrodes.

4. An electrode structure for a display as recited in Claim 1 wherein said metal alloy comprises an aluminum alloy.

5 5. An electrode structure for a display as recited in Claim 4 wherein said aluminum alloy comprises aluminum and neodymium.

10 6. An electrode structure for a display as recited in Claim 5 wherein said aluminum alloy comprises from approximately .5 atomic percent neodymium to approximately 6 atomic percent neodymium.

15 7. An electrode structure for a display as recited in Claim 5 wherein said aluminum alloy further comprises titanium.

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20 8. An electrode structure for a display as recited in Claim 7 wherein said aluminum alloy comprises up to approximately 5 atomic percent titanium.

25 9. An electrode structure for a display as recited in Claim 1 wherein said plurality of first electrodes further comprise
a cladding layer disposed over said metal alloy.

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10. An electrode structure for a display as recited in Claim 9 wherein said cladding layer comprises molybdenum and tungsten.

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11. An electrode structure for a display as recited in Claim 1 wherein said metal alloy comprises a silver alloy.

10 12. An electrode structure for a display as recited in Claim 11 wherein said silver alloy comprises silver and palladium.

15 13. An electrode structure for a display as recited in Claim 12 wherein said silver alloy comprises from approximately .5 atomic percent palladium to approximately 2 atomic percent palladium.

20 14. An electrode structure for a display as recited in Claim 12 wherein said silver alloy further comprises copper.

15. An electrode structure for a display as recited in Claim 14 wherein said silver alloy comprises from

approximately .5 atomic percent copper to approximately 2
atomic percent copper.

16. An electrode structure for a display as recited
5 in Claim 12 wherein said silver alloy further comprises
titanium.

17. An electrode structure for a display as recited
in Claim 16 wherein said silver alloy comprises up to
10 approximately 2 atomic percent titanium.

18. An electrode structure for a display as recited
in Claim 1 further comprising:

a passivation layer disposed over said plurality of
15 second electrodes.

19. An electrode structure for a display as recited
in Claim 18 wherein said passivation layer comprises
silicon nitride.

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20. An electrode structure for a display as recited
in Claim 1 further comprising a resistor layer overlying
said plurality of first electrodes, said dielectric layer
overlying said resistor layer.

21. A method for forming an electrode structure of a display comprising:

a) depositing a layer of metal alloy over a backplate;

5 b) depositing a cladding layer over said layer of metal alloy such that said layer of cladding overlies said layer of metal alloy; and

c) etching said layer of metal alloy and said cladding layer using a wet etch process so as to form a plurality of electrodes.

22. A method for forming an electrode structure of a display as recited in Claim 20 wherein step a) and step b) are performed sequentially in a single sputtering tool.

15 23. A method for forming an electrode structure of a display as recited in Claim 21 wherein said metal alloy comprises an aluminum alloy.

20 24. A method for forming an electrode structure of a display as recited in Claim 23 wherein said aluminum alloy further comprises aluminum and neodymium.

25 25. A method for forming an electrode structure of a display as recited in Claim 24 wherein said aluminum alloy

comprises from approximately .5 atomic percent neodymium to approximately 6 atomic percent neodymium.

26. A method for forming an electrode structure of a display as recited in Claim 24 wherein said metal alloy further comprises titanium.

27. A method for forming an electrode structure of a display as recited in Claim 26 wherein said aluminum alloy comprises up to approximately 5 atomic percent titanium.

28. A method for forming an electrode structure of a display as recited in Claim 21 wherein said cladding layer comprises molybdenum and tungsten.

29. A method for forming an electrode structure of a display as recited in Claim 21 wherein said metal alloy comprises a silver alloy.

30. A method for forming an electrode structure of a display as recited in Claim 29 wherein said silver alloy comprises silver and palladium.

31. A method for forming an electrode structure of a display as recited in Claim 30 wherein said silver alloy

comprises from approximately .5 atomic percent palladium to approximately 2 atomic percent palladium.

32. A method for forming an electrode structure of a display as recited in Claim 30 wherein said silver alloy further comprises titanium.

33. A method for forming an electrode structure of a display as recited in Claim 32 wherein said silver alloy comprises up to approximately 2 atomic percent titanium.

34. A method for forming an electrode structure of a display as recited in Claim 29 wherein said silver alloy further comprises from approximately .5 atomic percent copper to approximately 2 atomic percent copper.

35. A method for forming an electrode structure of a display as recited in Claim 34 wherein said silver alloy comprises up to approximately 2 atomic percent titanium.

36. A method for forming an electrode structure of a display comprising:

a) depositing a first metal alloy layer over a backplate;

b) masking and etching said first metal alloy layer so as to form a plurality of first electrodes;

c) depositing a resistor layer over said plurality of first electrodes;

5 d) depositing a dielectric layer over said resistor layer;

e) depositing a second metal alloy layer over said dielectric layer;

10 f) masking and etching said second metal alloy layer so as to form a plurality of second electrodes;

g) depositing a layer of silicon nitride over said plurality of second electrodes, said layer of silicon nitride adapted to protect said plurality of second electrodes during subsequent process steps.

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37. A method for forming an electrode structure of a display as recited in Claim 36 further comprising:

20 a1) disposing a cladding layer over said first metal alloy layer such that said layer of cladding overlies said first metal alloy layer.

38. A method for forming an electrode structure of a display as recited in Claim 36 wherein step b) further comprises:

b1) etching said first metal alloy layer and said layer of cladding sequentially in a single sputtering tool.

5 39. A method for forming an electrode structure of a display as recited in Claim 36 further comprising:

a1) disposing a cladding layer over said second metal alloy layer such that said layer of cladding overlies said second metal alloy layer.

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40. A method for forming an electrode structure of a display as recited in Claim 36 wherein step f) further comprises:

15 f1) etching said second metal alloy layer and said layer of cladding sequentially in a single sputtering tool.

41. A method for forming an electrode structure of a flat panel display as recited in Claim 36 wherein steps
20 b) and f) are performed using an etchant that includes nitric acid and phosphoric acid and ascorbic acid and water so as to form angled edges on each of said plurality of electrodes.

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42. A method for forming an electrode structure of a flat panel display as recited in Claim 36 wherein said first metal alloy layer and said second metal alloy layer comprise an aluminum alloy.

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43. A method for forming an electrode structure of a flat panel display as recited in Claim 36 wherein said first metal alloy layer and said second metal alloy layer comprise a silver alloy.

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44. The electrode structure of Claim 37 wherein said cladding layer further comprises molybdenum and tungsten.

45. A method for forming an electrode structure of a display comprising:

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a) forming a plurality of first electrodes;

b) depositing a resistor layer over said plurality of first electrodes;

c) depositing a dielectric layer over said resistor layer;

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d) forming a plurality of second electrodes; and

e) depositing a passivation layer over said plurality of second electrodes, said passivation layer adapted to protect said plurality of second electrodes during

subsequent process steps.

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46. A method for forming an electrode structure as recited in claim 45 wherein said passivation layer further comprises a layer of silicon nitride.

5 47. A method for forming an electrode structure as recited in claim 46 further comprising the step of forming a gate structure, said gate structure disposed over said layer of silicon nitride.

10 48. A method for forming an electrode structure as recited in claim 46 further comprising the step of forming a gate structure, said gate structure disposed between said plurality of second electrodes and said layer of silicon nitride.

15 49. A method for forming an electrode structure as recited in claim 46 further comprising the step of forming a gate structure, said gate structure disposed between said dielectric layer and said plurality of second
20 electrodes.

50. A method for forming an electrode structure as recited in claim 49 wherein said step of forming a gate structure further comprises the step of depositing a layer

of gate metal, said layer of gate metal masked and etched prior to the deposition of said layer of silicon nitride.

51. A method for forming an electrode structure as
5 recited in claim 49 wherein said step of forming a gate structure further comprises the step of depositing a layer of gate metal, said layer of gate metal masked and etched after the deposition of said layer of silicon nitride.

10 52. A method for forming an electrode structure as recited in claim 49 further comprising the step of forming a tantalum structure, said tantalum structure disposed between said gate structure and said plurality of second electrodes.

15 53. A method for forming an electrode structure as recited in claim 46 further comprising the step of depositing a dielectric layer prior to the step of depositing said layer of silicon nitride.

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54. An electrode structure for a display device comprising:

- 25 a) a plurality of first electrodes;
b) a resistor layer disposed over said plurality of first electrodes;

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c) a dielectric layer disposed over said resistor layer;

d) a plurality of second electrodes disposed over said dielectric layer; and

5 e) a passivation layer disposed over said plurality of second electrodes.

10 55. An electrode structure for a display as recited in claim 54 wherein said passivation layer comprises a layer of silicon nitride.

56. An electrode structure for a display as recited in claim 55 further comprising:

15 f) a gate structure, said gate structure disposed over said layer of silicon nitride.

57. An electrode structure for a display as recited in claim 55 further comprising:

20 f) a gate structure, said gate structure disposed between said plurality of second electrodes and said layer of silicon nitride.

58. An electrode structure for a display as recited in claim 55 further comprising:

f) a gate structure, said gate structure disposed between said dielectric layer and said plurality of second electrodes.

5 59. An electrode structure for a display as recited in claim 58 further comprising:

g) a tantalum structure, said tantalum structure disposed between said gate structure and said plurality of second electrodes.

10 60. An electrode structure for a display as recited in claim 55 further comprising:

g) a dielectric layer disposed between said plurality of second electrodes and said layer of silicon nitride.

15 61. A method for forming an electrode structure of a display comprising:

a) forming a plurality of first electrodes;

20 b) depositing a resistor layer over said plurality of first electrodes;

c) depositing a first dielectric layer over said resistor layer;

d) forming a plurality of second electrodes; and

25 e) depositing a second dielectric layer over said plurality of second electrodes, said second dielectric

layer adapted to protect said plurality of second electrodes during subsequent process steps.

5 62. A method for forming an electrode structure as recited in claim 61 further comprising the step of depositing a first sputtered molybdenum layer over said plurality of second electrodes.

10 63. A method for forming an electrode structure as recited in claim 62 further comprising the step of depositing an evaporated molybdenum layer over said first sputtered molybdenum layer and depositing a second sputtered molybdenum layer over said evaporated molybdenum layer, said second dielectric layer disposed over said
15 second layer of evaporated molybdenum.

64. A method for forming an electrode structure of a display comprising:

- 20 a) forming a plurality of first electrodes;
b) depositing a resistor layer over said plurality of first electrodes;
c) depositing a first dielectric layer over said resistor layer;
d) forming a plurality of second electrodes; and

e) depositing a layer of evaporated chromium over said plurality of second electrodes, said layer of evaporated chromium adapted to protect said plurality of second electrodes during subsequent process steps.

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65. A method for forming an electrode structure as recited in claim 64 further comprising the step of depositing an a second dielectric layer, said second dielectric layer disposed over said layer of evaporated chromium.

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66. A method for forming an electrode structure as recited in claim 65 further comprising the step of depositing an evaporated molybdenum layer over said layer of evaporated chromium, said second dielectric layer disposed over said layer of evaporated molybdenum.

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67. An electrode structure for a display device comprising:

- a) a plurality of first electrodes;
- b) a resistor layer disposed over said plurality of first electrodes;
- c) a first dielectric layer disposed over said resistor layer;

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d) a plurality of second electrodes disposed over said dielectric layer; and

e) a second dielectric layer disposed over said plurality of second electrodes.

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68. An electrode structure for a display as recited in claim 67 wherein said dielectric layer comprises a layer of silicon dioxide.

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69. An electrode structure for a display as recited in claim 68 further comprising:

f) an evaporated molybdenum layer disposed between said sputtered molybdenum layer and said second dielectric layer.

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